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EXAMINER

HEIN, GREGORY P

ART UNIT PAPER NUMBER

2188

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/828,286

Applicant(s)

NAKAGAWA ET AL.

Examiner

Gregory P. Hein

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/16/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1- 6, 8 - 11, 16 - 18, 20 is/are rejected.
- 7) ☒ Claim(s) 7, 12 - 15, 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/2/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Status of Claims

Claims 1 - 20 are presented for examination; claims 1 – 6, 8 – 11, 16 - 18 and 20 are rejected, claims 7, 12 – 15 and 19 are objected.

Claim Objections

1. Claim 7 is objected to as being dependent on a rejected claim.
2. Claim 19 is objected to as being dependent on a rejected claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 – 4, 6, 9, 11, 16, 17 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 recites the limitation "the storage system" in line 6. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 1 recites the limitation "a network" in line 3. It is unclear if this limitation is equivalent to claim 1, which recites the limitation "a network" on line 2.
5. Claim 2 recites the indefinite limitation "the storage system" in line 2. It is unclear which of the plurality of storage systems in claim 1 line 2 is being referenced.

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6. Claim 2 recites the limitation "a correspondence" in line 2. It is unclear if this limitation is equivalent to claim 1, which recites the limitation "a correspondence" on line 5.
7. Claim 3 recites the indefinite limitation "the network" in line 4. It is unclear whether it refers to line 2 of claim 1 or line 3 of claim 1.
8. Claim 4 recites the indefinite limitation "the storage system" in line 3. It is unclear whether it refers to line 7 of claim 1 or line 11 of claim 1.
9. Claim 6 recites the limitation "the other storage subsystem" in line 2. There is insufficient antecedent basis for this limitation in the claim.
10. Claim 9 recites the limitation "the instructions" in line 4. There is insufficient antecedent basis for this limitation in the claim.
11. Claim 11 recites the limitation "a network" in line 4. It is unclear if this limitation is equivalent to claim 11, which recites the limitation "a network" on line 2.
12. Claim 16 recites the limitation "a computer" in line 4. It is unclear if this limitation is equivalent to claim 16, which recites the limitation "a computer" on line 1.
13. Claim 16 recites the limitation "the other storage system" in line 8. There is insufficient antecedent basis for this limitation in the claim.
14. Claim 17 recites the limitation "a computer" in line 4. It is unclear if this limitation is equivalent to claim 17, which recites the limitation "a computer" on line 2.

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15. Claim 20 recites the indefinite limitation "the storage system" in lines 11, 12 and 19. It is unclear which of the plurality of storage systems in claim 20 line 1 is being referenced.

16. Claim 20 recites the limitation "a level indicating a specific performance" in line 12. It is unclear if this limitation is equivalent to claim 20, which recites the limitation "a level indicating a specific performance" on line 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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Claims 1 – 2, 4, 8, 10 – 11, 16 - 18 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Soejima (U.S. Pre-Grant Publication 2004/0123180).

17. For claim 1 Soejima teaches:

A method of managing volumes of a plurality of storage systems, by a management computer (Soejima ¶220 – 222 and Fig. 23) connected via a network to the plurality of storage systems having volumes connected to a computer via a network and storing data used by the computer (Soejima Fig. 23 shows a plurality of connections between the storage devices and computers to form a network), the method comprising the steps of:

keeping a correspondence between a level indicating a specific performance of a volume, and storage system characteristics of the storage system (Soejima ¶72 lines 7 – 15);

obtaining from a first storage system a level indicating a performance of a volume allocated to the computer by the first storage system (Soejima ¶78); and

referencing the storage system characteristics of the first storage system that corresponds to the obtained level indicating the performance of the volume and storage system characteristics of another storage system that corresponds to the obtained level indicating the performance of the volume, respectively, and comparing the performances of the volumes of the respective storage systems against each other (Soejima ¶75 lines 1 - 7).

18. For claim 2 Soejima teaches:

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A correspondence is obtained from the storage system connected to the computer (Soejima ¶75 lines 1 – 7 teach obtaining information from the communication device and from the performance management unit. Both the communication device and the performance management unit are contained in the storage device connected to a computer as shown in Fig. 4 and Fig. 3).

19. For claim 4 Soejima teaches:

The comparison of the performance of the respective volumes is also performed when a new correspondence is obtained from the storage system (Soejima ¶71 lines 9 – 12 teach triggering a performance adjustment upon detection of a configuration modification. The change in configuration establishes new relationships between the volumes and the apparatuses).

20. For claim 6 Soejima teaches:

The step of instructing the other storage subsystem, based on the results of the comparison, to allocate to the computer a volume having storage system characteristics of the other storage system corresponding to the obtained level (Soejima ¶150 teaches the determining the allocation of volumes based on performance measures).

21. For claim 8 Soejima teaches:

The comparison of the respective levels indicating a specific performance is not performed in a case where the level indicating the specific performance of the volume indicates that the specific performance is not needed (Soejima ¶237).

22. For claim 10 Soejima teaches:

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In a case where there are a plurality of specific performances, the comparison is performed using the highest level of performance (Soejima Fig. 28 shows the flow diagram for performance adjustment. The flow chart continues to evaluate each volume within a parity group until all possible destination and source volumes have been considered).

23. For claim 11 Soejima teaches:

A method for managing a volume of a first storage system connected to a computer via a network, and a volume of a second storage system connected to the first storage system, by a management computer connected to the first storage system and the second storage system via a network, (Soejima Fig. 3 shows two storage apparatuses communicatively connected by **2600**.

Additionally, the storage apparatus is connected via **2400**, **2500** and **3600** to the host computers.), the method comprising the steps of:

keeping a correspondence between a level indicating a specific performance of a volume and a storage system characteristics indicating a performance of the storage system, for each of the storage systems (Soejima ¶72 lines 7 – 16);

obtaining a level indicating a specific performance of a volume of the first storage system, and a level indicating a specific performance of a volume of the second storage system connected to the volume of the first storage system (Soejima ¶78);

comparing the storage system characteristics corresponding to the obtained level (Soejima ¶71); and

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storing data stored in the volume of the second storage system into the volume of the first storage system, based on the results of the comparison (Soejima ¶71).

24. For claim 16 Soejima teaches:

A volume connected to a volume of another storage system storing data used by a computer (Soejima ¶132 wherein Fig. 3 clearly shows that storage apparatuses **3400** and **2310** are communicatively connected via **2600**);

a memory for keeping a correspondence between a level indicating a specific performance of the volume, and storage system characteristics of the storage system, for each of the storage systems (Soejima ¶136 lines 1 – 3; ¶139); and

a control unit for controlling access made to the first storage system or the other storage system from the computer, wherein the control unit obtains the level indicating the specific performance of the volume of the other storage system (Soejima ¶73 lines 1 - 3), references the storage system characteristics of the first storage system and the other storage system corresponding to the level based on the correspondence, and compares the referenced values (Soejima ¶75 lines 1 - 8).

25. For claim 17 Soejima teaches:

Based on the result of the comparison, the data is stored into a volume having the storage system characteristics corresponding to the level indicating the specific performance of the volume of the first storage system (Soejima ¶75 lines 6 – 7 teach "...determine whether or not the performance of a destination

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volume should be adjusted, and adjust the performance of the destination volume if necessary...”).

26. As per claim 18, the rejection of claim 1 is incorporated herein. As per the management computer described in lines 1 – 6 of claim 18:

A storage medium storing a program that can be read by a computer managing volumes of a plurality of storage systems (Soejima ¶220 lines 8 –11 and ¶222), which program is executed by a management computer connected via a network to the plurality of storage systems having volumes that are connected to a computer and to the plurality of storage systems to store data used by the computer (Soejima Fig. 23 clearly shows a management computer connected via a network to a plurality of storage systems. Soejima Fig. 24 shows a CPU 24000 which executes said programs.)

27. As per claim 20, the rejection of claims 1 – 2, 4, 8, 10 – 11 and 16 - 18 is incorporated herein.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soejima.

28. For claim 3:

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Soejima teaches triggering a performance adjustment when a change in configuration is detected (Soejima ¶71 lines 9 - 12).

Soejima differs from the claimed invention in that Soejima does not explicitly explain that added storage systems constitute a change in configuration.

The claimed invention teaches a method comparing performance data of all storage systems after an additional storage system is attached the management computer. Soejima teaches methods that acquire information from all storage apparatuses frequently. This information includes volume information, apparatus information and topology information (Soejima ¶222). It would be obvious to one of ordinary skill in the art that given a method regularly collecting this information from all storage apparatuses, adding a new storage system constitutes the type of performance adjustment triggering configuration modification that Soejima discloses.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soejima in view of Kaneda et al. (U.S. Pre-Grant Publication 2005/0022201).

29. For claim 5:

Soejima teaches reassigning and migrating volumes based on attributes of the volumes (Soejima ¶95 lines 1 - 4).

Soejima differs in that he does not disclose the values used to represent the attributes.

Kaneda et al teaches that the attributes assigned to a particular volume take on integer values between 1 and 10. The set 1 - 10 is the simplest and one of the

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most common sets used to select relative importance. It would have been obvious to one of ordinary skill in the art at the time of the invention to use this set since Kaneda et al and Soejima both teach techniques to optimize performance by moving and reassigning volumes based on attributes and performance data while minimizing the level of difficulty involved.

Allowable Subject Matter

30. Claims 12 – 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory P. Hein whose telephone number is 571-272-4180. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about

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the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregory Hein
September 2, 2005

Kevin L. Ellis
Primary Examiner

